Abstract: National University, Bangladesh has 2086 affiliated colleges and institutions with 1.5 million students. In spite of having many opportunities to serve the nation, the National University Library (NUL) is not able to act as an exact academic library and information centre. So the question arises why it is not able to perform its noble role? To extricate the cause, there is no doubt about the fact that the existing manual systems are not capable to support the current and future requirements. Realizing the continuous demand for the easy access to information of the user and to keep pace with the present government vision to make Bangladesh digital within 2021, this is the right time to transform the library from manual to automation with an integrated library system using open source software. The new systems will offer more flexibility and functionality than the system that was in use. The main purpose of the study is to suggest a model plan for National University (NU) central library automation system using open source software KOHA and develop its capacity for the users. The paper will also try to visualize how the affiliated college libraries throughout the country can be integrated by turns with NU central library for proper resource-sharing and networking.

Key Words: E-Library; Model Plan; Library Integration; National University; College Libraries

Background

In Bangladesh the present government has already fixed its target of achieving ‘Digital Bangladesh’ by 2021. It sounds good but the concept of Digital Bangladesh is still not clear to the citizen, they are not aware of the output of Digital Bangladesh (Siddique, 2010). The scope of Digital Bangladesh is that the government wants to make Bangladesh fully digitized by 2021 through application of third generation Information and Communication Technology (ICT). In education sector, Digital Bangladesh visualizes that by 2021 all universities, colleges, high schools and primary schools will have internet connectivity. ICT is intended to be used as teaching–learning aids. After five years of schooling all students should have regular access to computers with internet facilities. The goal is to improve the quality of education. It is recognized that college libraries play an important role for establishing a knowledge-based society. Quality of education of a country is impossible without the modernization of college libraries (Ogunsola, 2011). More than four decades have passed since the independence of Bangladesh, although considerable developments have been made in various sectors, unfortunately, academic libraries received little attention. The use of ICT in Non-government College libraries are yet to spread all over the country and they have to go a long way to be used automation for performing their activities (World Bank, 2012). It can be said that the academic
libraries specially the non-government college libraries of Bangladesh are not able to act as academic libraries in the truest sense of the term. No college library has reached the level of development required to effectively support education, research and socio-economic development. To meet the international standard, first of all NUL should be automated and then its affiliated college libraries need to integrate. In view of this, an attempt has been made to prepare a suitable plan for establishing automated academic libraries both at NU main campus and throughout the country. The study has taken into account the present infrastructural facilities, economic change, social development, technological innovations, environmental impacts, effective use of e-resources, staff development, knowledge transfer, resource planning, quality issues and overseas links for suggesting a model plan. The existing administration has undertaken necessary steps to transform the Gazipur campus into a Centre of Excellence with a focus on higher research and learning at the post-graduate level leading to M. Phil. and Ph.D. degrees leaving the matter of imparting classroom education to the affiliated colleges and institutions. In this endeavor and the fulfillment of the vision, automation of NUL and integration with all affiliated college libraries are inevitable. The study reveals both practical and professional experiences of the author. A comprehensive need assessment has been done successfully on the NU central library and the affiliated college libraries since March 2014. Analyzing the need, the study suggests a suitable model plan for establishing e-Library.

Objectives

The main objective of the study is to suggest a model plan for converting all the existing resources of NU central library from manual to e-Library systems following the international standard format. The other objectives can be summarized as follows: (a). to systematize integration among all of the affiliated college libraries throughout the country and bring these under one network connections with NU central library as focal point; and (b). to reinforce the responsibility and function of the NU library radically.

Methodology

The paper is based on mainly secondary data though physical visit has also been done in most of the divisional level affiliated college libraries to examine their present ICT status. For scarcity of printed literature in Bangladesh on the emerging field of e-Library, the internet is a major source for many of the literatures on this new area of study. The sources of data are: websites of all public and private university libraries in Bangladesh, access to Information (A21) program, UGC Digital Library (UDL) project, etc. The study were also extensively explored electronic resources related with research studies, articles, survey reports, journals, newsletters, international professional organization websites, etc. By using and citing data from these sources, special emphasis have been given on software practices in different university libraries in Bangladesh, the e-Library trends, library automation systems and services, library open source software, equipment needed for e-library, the infrastructural facilities needed for transforming library from manual to automation and so on. Besides these, the practical knowledge and professional experiences of the author helps to design a pragmatic model plan for converting National University Library into e-Library.
Present Scenario of the National University Library

The central library is located at the 2nd floor of Bari Bhaban (building) with a sufficient space for its readers. A total of 37,000 collection covers 35 subject areas are available in the library. NUL also collects a wide number of national and international journals. Most of the resources (60%) are collected through purchase; 10% from donation and remaining 30% either by gift or exchange program. In processing, it follows international standards. The users are mainly of faculties; M. Phil. and Ph. D. researchers; students in Masters of Advanced Studies; Government and Non-government College Teachers who attend the training program at NU regularly and so on. There are two spacious (approximately 5,000 sqf each) reading sections equipped with necessary furniture for users and open shelves for learning resources. It has one reference section; two processing sections; one administrative section; one acquisition section; one journal section; and a corner of covering rare collections on Liberation War is available (National University: 2014).

Meanwhile broadband connections with high speed internet (38mbps) have been ensured for each section of the library. The authority has already approved budget for (a) transforming the manual library into e-Library with a view to provide digital library services for its users (b) preparing database on affiliated college libraries throughout the country for integration with NUL (c) training the existing NUL staffs and college librarians for operating and providing e-resources for their own users. NUL has also entered into the global e-book collection through HEQEP project under UGC, funded by the World Bank. Three world reputed publishers namely Francis and Taylor; Cambridge and Sage Publisher’s e-book can be used (UGC, 2014). The manpower of the NUL is not sufficient right now. A total of 13 staffs are working in the library of which most are non-professional. The library is open from morning to till night as teachers training program has been continuously taking place in the whole academic year. The following services are being provided by the library: Lending services, Newspaper Clipping services, Current Awareness Services (CAS), Selective Dissemination of Information (SDI) services, Reference services, Bibliographic services, Indexing and Abstracting services and Reprographic services (http://www.nu.edu.bd/?p=968). NUL has open access policy so that every user can use the library. In spite of having many challenges, it provides such kind of services which are available in other reputed academic libraries.

Description of the Model Plan

The following five steps are necessary for automating NU central library and establishing the network with its affiliated college libraries:

- Standardization of bibliographic data
- Selection of Software
- Preparation of union catalogue
- Use of computer equipment
- Establishment of network among affiliated college libraries
Standardization of Bibliographic Data

The priority of this model plan is to standardize the format, which is basic, means of bibliographic data depending on the current collection of the NUL, and other affiliated college libraries which have at least one computer. Last couple of months the study has examined the current practice of data format of the NUL and found that no standardized system has yet been followed there. Therefore, the study in its model plan suggests establishing the MARC format (using WORD 6.0 or any format) for its resources to standardized bibliographic data process. It will set the formats for books, serials and non- book materials as Bangladeshi Standard (BS) and plan to setup the database in a standardized system by including other formats.

Selection of Software

To automate operations in standard format as a focal point of networking and resource-sharing, NUL needs software with minimum modules which are mainly for acquisition, technical processing, lending, searching, data management and network capacity with integration options. Gradually, NUL can extend its modules based on the exponential growth of collection and demand of its users. For the convenient of the selection of suitable library software from open sources, the study needs to discuss previously used software so that the user can extricate the cause of why this software’s have been abandoned. Following are the important library software’s which were used earlier in the Southeast Asian region: CDS/ISIS, MINISIS, Dynex, Horizon, BASIS PLUS, ILMS, INNOPAC, LIBSYS, LIBRIS and OASIS. At present, no one of the above mentioned software’s are being used due to frequently change of the operating systems. Most of the early software’s were being used in DOS-mode which failed to keep pace with modern operating systems (Nebeolise & Osuchukwu: 2014). The basic problem of these software’s were that these were good to organize only the in-house databases and no one was internet friendly; therefore, library integration was almost impossible by them (Kamble, 2012). The table below has shown different aspects of latest OSS (Open Source Software) with their features. This comparative analysis has been done due to choose right software for NU central library with a view to integrate all of the affiliated college libraries.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Software</th>
<th>Working Environment</th>
<th>Developed/ Marketed</th>
<th>Application Possible</th>
<th>Suitability for Libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>KOHA</td>
<td>Windows and Linux</td>
<td>Harowhenua Library Trust, New Zealand in 2000</td>
<td>It is web-based Integrated Library Management System (ILS), with a SQL database (My SQL preferred) backend with cataloguing data stored in MARC and accessible via Z39.50.</td>
<td>Most popular software. It has the capacity to manage digital libraries and online and offline electronic resources</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Name of Software</td>
<td>Working Environment</td>
<td>Developed/Marketed</td>
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<tr>
<td>02</td>
<td>ABCD</td>
<td>Fully web-based, so can be used and managed from any current web-browser</td>
<td>BIREME (WHO, Brazil) in collaboration with the Flemish Interuniversity Council, Belgium, and using UNESCO’s ISIS database technology</td>
<td>OPAC with simple Google; Built up with technologies such as ISIS database; ISIS formatting language, CISIS, ISIS Script, ISIS NBP, Java Script, Groovy and Jetty, PHP, My SQL, Apache, and YAZ</td>
<td>Small and Medium Libraries</td>
</tr>
<tr>
<td>03</td>
<td>NewGenLib</td>
<td>Windows and Linux flavors available</td>
<td>Versus Solutions Pvt. Ltd. Domain expertise is provided by Kesavan Institute of Information and Knowledge Management Hyderabad, India</td>
<td>Complies with international metadata and interoperability standards: MARC21, MARC, XML, z39.50, SRU/W, OAI</td>
<td>All Types of Large Libraries</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Supports multi user and multiple security levels</td>
</tr>
<tr>
<td>04</td>
<td>D-space</td>
<td>It uses a relational database, and supports the use of PostgreSQL, SQL and Oracle</td>
<td>HP-MIT Alliance in 2002</td>
<td>It currently support two primary web interfaces a classic one (JSPUI) which uses JSP and the Java Servlet API, and a newer interface (XMLUI) based on Apache Cocoon and using XML and XSLT technologies</td>
<td>DSpace can be used for self archiving by institutions and faculties. It provides long term physical storage and management of digital items in a repository</td>
</tr>
<tr>
<td>05</td>
<td>Greenstone</td>
<td>Windows, Linux, Apple Mac etc</td>
<td>New Zealand Digital Library project research group at the University of Waikato and is sponsored by the UNESCO (<a href="http://www.unesco.org">http://www.unesco.org</a>)</td>
<td>Greenstone builds collections using almost popular and standard digital formats such as HTML, XML, Word, Post Script, PDF, RTF, and many other formats which include audio as well as video</td>
<td>All Types of Large Libraries</td>
</tr>
<tr>
<td>06</td>
<td>OpenBiblio</td>
<td>PHP</td>
<td>PHP Alliance</td>
<td>OPAC+ Acquisition, Circulation, Serials and Management Control</td>
<td>All Types of Large Libraries</td>
</tr>
</tbody>
</table>

Source: Courant and Griffiths, 2008
As the study has availed the opportunity to survey the existing non-government college libraries in Bangladesh, so based on the different major issues like collection, capacity, user satisfaction, manpower, the current infrastructure, financial capability, need for integrity of the divisional and district college libraries with the focal point (NUL, Gazipur) etc., the study would like to suggest “KOHA Software” for installing at NUL which is quite user friendly. A question may be raised why the study has chosen this software. It has some good reasons. Below are the details of the software:

KOHA is the first Open Source library management system and it was initially developed by Harowhenua Library Trust, New Zealand in 2000. Now the project has grown as one of the popular Open Source Library management system by large group of volunteers from various parts of the world. More than ten open source library management systems are available, but very few of them popular in library automation market. KOHA project started as a non-profit initiative and it strictly follows the principles of Open Source philosophy. According to lib-web-cats, 1519 large libraries are using KOHA worldwide (Dhamdhere, 2011). Following are the key features which place KOHA first in priority list of library professionals: a). It has simple and clear interface for librarians and members; b). It has various Web 2.0 facilities and union catalog facility; c). KOHA is famous for its customizable search capacity and wide range of circulation and borrower management; d). It has full acquisitions system including budgets and pricing information; e). Out of many modules, it has simple acquisitions system for the smaller library and has ability to cope with any number of branches, patron categories, item categories, currencies and other data; and f). Koha has easy barcode printing option. Therefore, considering the web-based interfaces and its ease of use, KOHA achieved wide popularity in every part of the world, especially in the developing countries (Kumar, 2010). Moreover, it has been developed by one of the most reputed ILS vendors in the world; so, the study firmly believes that this software would be an ideal choice for the NUL. Initially, NUL needs the following modules for automating its main library functions which has been shown in Figure 1. Gradually, based on the demand of the user and increase the service pattern among its affiliated college libraries, NUL can purchase more modules.

Figure-1: Automation of National University Library Functions
Preparation of Union Catalogue

In the third step, the study suggests to develop a central union catalogue in NU main campus with the resources of NU central library and the affiliated college libraries. It will be a database with huge collection. Through a shared cataloging system, the affiliated college libraries can easily search and access into it and get their desired resources. It needs some time to include all of the resources into one database at a time. Therefore, the model plan suggests step by step data entry of the affiliated college resources from divisional level to district level and then upazilla level. By turns, all the reading materials of the NUL, Gazipur and affiliated college libraries will be added and updated for the convenient of the user. The NU regional centres can work as focal points of the affiliated colleges in this respect as there are six regional centres have already been setup in each division.

Use of ICT’s

To establish the library network, both NUL and its affiliated college libraries should be equipped with computer and other necessary communications technologies. The study revealed that the current infrastructure of the NU and many of the upazilla level college libraries are not suitable at all for setting up the main server or even using computer technologies as well. Due to the budgetary constraints, most of the colleges are not afford to buy required computer and necessary technologies. Even they have no suitable space for operating network. During the survey of the non-government college libraries, the study found that each upazilla has minimum three colleges on an average where only one has hardly one computer but these are obsolete as well. There is no professional computer operator though ICT has been adopted as a mandatory course in the college education. The study suggests developing the facilities with updated computers and other technologies. For establishing e-Library with a view to integrate the college libraries, the following important technologies are needed: server, network accessories and its proper installation, software installation with customization, brand computers (Core i5), laptop (Core i7), scanner, barcode reader, barcode printer etc.

Establishment of Network among Affiliated College Libraries

Besides the main campus in Gazipur, there are six Regional Centres in six administrative divisions to run the affairs of the University. For smooth operation of the university functions like conducting examination in time, quick supplying educational equipment and close monitoring of the countrywide college education, NU has already been decentralized its administration by setting up regional centres in each divisions. NUL (as focal point) will get the advantage to establish its network configuration with these regional centres by which all of the colleges under each region will come into the library network, by turns. Regional centres will work as the focal points of all kinds of network communication of the affiliated colleges which will be directly connected with NUL. The study suggests to operate the network in one-way system first which is as follows: the computer equipped with six regional centres would be connected to the server of the focal
point (NUL, Gazipur) in on-line system to search and download the bibliographic database of NUL, so that they can utilize the data in building up their own library database. As long as the NUL and member libraries develop and use the Shared Cataloguing System, then and there, two-way networking systems will be established.

**Proposed Network Configuration for NU Affiliated College Libraries**

In this model plan the network topology for all divisional networks have been designed as WAN (Wide Area Network) through regional centres on the basis of the physical location of the affiliated college libraries in the country and data flow requirements. It is expected that initially all focal points of the divisional networks and gradually all the nodes of the networks will have access to other international databases through the internet. The interaction among the nodes of the proposed networks will be non-directed. It is proposed that each node of the network will have access to any of the nodes of the network directly or through the focal point. But the main function of the focal point of the proposed networks will be coordination and development of the networks.

**Justification for Using Non-Directional Cycle for Visualizing the Network Operations**

Based on the 5th law of S. R. Ranganathan, “Library is a growing organism” the study believes that the number of libraries and their collections are increasing day by day. Keeping this law in mind, the study uses Non-Directional Cycle for visualizing the network configuration. This cycle is flexible enough to incorporate upcoming educational institutions with their cumulative collections.

In the first phase, the following 6 Divisional affiliated college libraries may join the network through NU regional centres:

- Divisional affiliated college libraries, Rajshahi
- Divisional affiliated college libraries, Chittagong
- Divisional affiliated college libraries, Khulna
- Divisional affiliated college libraries, Sylhet
- Divisional affiliated college libraries, Barisal
- Divisional affiliated college libraries, Rangpur

**Figure-2: Configuration for Divisional Affiliated College Library Network**
Where NUL, Gazipur is the Focal Point (FP) and 6 divisions and others are Node (N). In the second phase district college libraries of Dhaka Division may join the network through NU central library.

**Figure-3: Network with District College Libraries of Dhaka Division**

In the second phase District College Libraries Network within Dhaka Division:

![Network with District College Libraries of Dhaka Division](image)

**Figure-4: Configuration for Network of Rajshahi Division**

In the third phase college libraries of Rajshahi district may join the network through its regional centre:

![Configuration for Network of Rajshahi Division](image)

Where NU Rajshahi Regional Centre is the Focal Point (FP) and others is node (N).
Figure-5: Network with college Libraries of Chittagong District through its Regional Centre

In the fourth phase District College Libraries under Chittagong Division may join network

Where Regional Centre, Chittagong is the Focal Point (FP) of affiliated college libraries and others are node (N).

Figure-6: Network with District College Libraries of Khulna Division

In the fifth phase District college libraries under Khulna Division may join the network through NU Khulna Regional Centre

Where Regional Centre, Khulna is the Focal Point (FP) and others are node (N).
**Figure-7: Network with District College Libraries of Barisal Division**

In the sixth phase District college libraries of Barisal Division may join the network through NU, Barisal Regional Centre

Where NU Regional Centre, Barisal is the Point (FP) and others are node (N).

**Figure-8: Network with District College Libraries of Sylhet Division**

In the seventh phase District college libraries of Sylhet Division may join the network through NU, Sylhet Regional Centre

Where Sylhet Regional Centre is the Focal Point (FP) and others are node (N).
Figure-9: Network with District College Libraries of Rangpur Division

In the 8th phase District college libraries of Rangpur Division may join the network through NU, Rangpur Regional Centre.

Where NU Rangpur Regional Centre is the Focal Point (FP) and others are node (N).

Implementation

The proposed network can be implemented phase by phase as follows:

- First of all, each participating divisional college libraries should be designated with a unique collection through its regional centre. These should concentrate on their core collections. This needs a detailed survey of a collection and its use.
- All Focal Points should immediately take up the compilation work of the Union Catalogue of collections.
- All important tools required for networking will have to be ascertained. Some of them should be acquired and compiled according to need.
- Cooperative acquisition under the present administrative set up is possible at this stage. Cooperation among network members for preparation of acquisition lists/catalogue cards and their distribution could be initiated. Accordingly, in the first phase all divisional networks will be formed and made functional with minimum network activities through their regional centre. Depending on the success of phase 1, an integrated network should be developed by combining the focal points of all divisional networks.
Functions

The proposed model plan can perform the following functions:

- All housekeeping operations and networking of the country-wide college libraries affiliated by the NU will be automated which will include full-fledged services of acquisition comprising identification and selection of reading materials, issuance of order, receiving of books as per order and payment etc. in an automated way. Automated processing comprises sealing, making accession, classification, cataloguing, data entry, determining subject headings, management of bibliographical information of reading materials, control of serial holdings, pasting date due slip, book card and book pocket and preparation of library tools etc.

- E-mail and internet systems will be implemented in the college libraries in Bangladesh.

- Searching facilities both on-line and off-line will be available for the user such as students and teachers and information can be retrieved very easily through central catalogue using integrated databases.

- Literature search services, news clipping services, web based library services and building of electronic archives would also be automated by using this proposed model plan.

Cost Benefit Analysis

The cost benefit analysis has not been taken into consideration during the development of the proposed model plan. Furthermore, the technological aspects for implementation of the model plan have also not been taken into account due to resource constraint. More studies on users of the college libraries would have exposed a better picture.

Weaknesses

During the survey through physical visit it has been found that the existing infrastructural conditions of the most of the college libraries are not encouraging. While only a few college libraries have personal computers, they do not have any trained personnel required for networking. No union catalogues or accession lists are available at present. Almost all libraries suffer from acute financial problems, the outlook of relevant authorities (both government and institutional) is not encouraging. Synthesizing the weakness of the affiliated college libraries, the following critical problems have been identified: (a). lack of internet connection in most of the rural college libraries; (b). in terms of using technologies, digital divide found in rural college libraries to compare with urban college libraries; (c). college management committee (CMC) or Governing Body does not care about library due to proper knowledge; (d). the college authority allotted a store room for library instead of an organised room as they do not understand its importance; (e). to get affiliation from NU, most of the colleges temporarily collects books from vendors before inspection; (f). lack of trained library personnel and training
facilities; (g). poor status of librarians; (h). lack of inspiring student to use their library for academic development, etc.

Conclusion

To enhance quality education at college level, teachers and students need access right to NUL due to the availability of its subject-based vast collections. Only e-Library can ensure it. Most of the college teachers and students are not getting opportunity to access into huge accumulation of knowledge due to lack of proper technology. But they are the vital educational force in the country. Traditional library systems cannot bear any fruitful outcome for increasing the number of users and in the development of knowledge-base society as well. The model plan for e-Library implies how it will function. Following are some of the suggestions emerging out of the findings of the present study for smooth implementation and operation of e-Library:

- As the district and upazilla level college libraries are not fully equipped with the resources and technological facilities, both Government and NU authority should come forward for its improvement
- Training programmes should be arranged and manuals should be developed to upgrade the knowledge and skills of the staff on e-Library
- An effective communication system among the participants of the network should be developed through union catalogues, bibliographies, current awareness services, indexing and abstracting services, newsletters etc. for efficient utilization of information sources and services
- Steps should be taken to gradually build up a pool of skilled and trained personnel, adequate computer/technological, reprographic and translation facilities among the staffs.
- Adequate infrastructural facilities should be developed and holdings of the college libraries should be computerized using common communication formats, to ensure successful implementation of the automation.

References


